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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/371,692	08/10/99	KALSI S	05770/082001

EXAMINER	
PEREZ G	
ART UNIT	**PAPER NUMBER**
2834	

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DATE MAILED: 12/20/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/371,692	KALSI, SWARN S.	
	Examiner	Art Unit	
	Guillermo Perez	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

15)☒ Notice of References Cited (PTO-892)
16)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18)☐ Interview Summary (PTO-413) Paper No(s). _____ .
19)☐ Notice of Informal Patent Application (PTO-152)
20)☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1 to 4, 9, 12 to 14, 16 and 21 to 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. (U. S. Pat. No. 5, 325, 002) in view of Higashi (U. S. Pat. No. 4,885,494).

Rabinowitz et al. ('002) disclose a superconducting electric motor (figure 6) comprising:

a rotor (61) assembly including:

at least one superconducting winding (62, 63) which, in operation, generates a flux path within the rotor assembly; and

a support member (61) which supports the at least one superconducting winding, the rotor assembly configured to operate in a synchronous mode of operation at temperatures wherein the superconducting winding exhibits superconducting characteristics and in an induction mode of operation at temperatures wherein the superconducting winding exhibits non-superconducting characteristics (column 6, lines 60 to 64; column 9, lines 4 to 15 and 33 to 38); and that

the rotor assembly includes induction structure configured to allow the superconducting motor to generate a starting torque which is at least 50% of the rated torque in the induction mode of operation (column 9, lines 4 to 32); and that

the rotor assembly includes induction structure configured to allow the superconducting motor to generate a peak torque which is approximately twice the rated torque in the induction mode of operation (column 9, lines 4 to 32); and that

the induction structure includes the support member (61) which supports the at least one superconducting winding; and

a stator assembly electromagnetically coupled to the rotor assembly; and an adjustable speed drive provides an electrical signal to the stator assembly (column 9, lines 4 to 32); and that

the adjustable speed drive provides a signal at a first frequency to the stator to start the superconducting motor in the synchronous mode of operation and provides a signal at a second frequency, less than the first frequency, to the stator in the induction mode of operation (column 9, lines 4 to 32); and that

the superconducting winding includes a high temperature superconductor (see Table 2) and that the support member is formed of aluminum; and

a method of operating a superconducting electric motor of the type including a rotor assembly including at least one superconducting winding which, in operation, generates a flux within the rotor assembly, and a support member which supports the at least one superconducting winding, the method comprising:

monitoring the temperature of the superconducting winding;

operating the superconducting motor in a synchronous mode at a temperature wherein the superconducting winding exhibits superconducting characteristics; and

operating the superconducting motor in an induction mode at a temperature wherein the superconducting winding exhibits non-superconducting characteristics (column 9, lines 4 to 32); and that

operating the superconducting motor in the synchronous mode includes providing an electrical signal to a stator assembly, electromagnetically coupled to the rotor assembly, the signal having a first frequency; and operating the superconducting motor in the induction mode includes providing a signal to the stator assembly at a second frequency, less than the first frequency (column 9, lines 4 to 32). However, Rabinowitz et al. ('002) do not disclose that the rotor assembly includes induction structure for carrying current at levels sufficient to allow the steady-state induction mode of operation.

Higashi discloses that the rotor assembly includes induction structure for carrying current at levels sufficient to allow the steady-state induction mode of operation column 4, lines 38-61), for the purpose of improving efficiency of the electric motor at start-up and operation.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002) and provide it with a rotor assembly including induction structure for carrying current at levels sufficient to allow the steady-state induction mode of operation as disclosed by Higashi, for the purpose of improving efficiency of the electric motor at start-up and operation.

2. Claims 5 to 8, 10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. ('002) in view of Higashi as applied to claims 1, 4 and 9 above, and further in view of Rabinowitz (U. S. Pat. No. 4, 176, 291).

Rabinowitz et al. ('002) and Higashi disclose a superconducting electric motor as described on item 1 above. However, neither Rabinowitz et al. ('002) nor Higashi disclose that at least a portion of the induction structure is spaced from the at least one superconducting winding by a thermal isolation vacuum region; nor that said at least portion of the induction structure spaced from the at least one superconducting winding by a thermal isolation vacuum region includes an electromagnetic shield member; nor that a cryostat positioned between the thermal isolation vacuum region and the induction structure; nor that said electromagnetic shield member includes a conductive, non-magnetic material; nor that the induction structure further includes an electromagnetic shield spaced from the at least one superconducting winding by a thermal isolation vacuum region; nor that the superconducting winding is a racetrack shaped winding.

Rabinowitz ('291) discloses that at least a portion of the induction structure is spaced from the at least one superconducting winding by a thermal isolation vacuum region (19); and that

said at least portion of the induction structure (18) spaced from the at least one superconducting winding (44) by a thermal isolation vacuum region (19) includes an electromagnetic shield member (18); and

a cryostat (58, 59, 60) positioned between the thermal isolation vacuum region and the induction structure; and that

said electromagnetic shield member includes a conductive, non-magnetic material; and that

the superconducting winding is a racetrack shaped winding, for the purpose of screening the superconducting winding from non-synchronous components of the magnetic fields produced by unbalanced or transient currents in the armature winding and absorb thermal radiation from the ambient temperature and re-radiating it at a lower temperature.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002) and Higashi and provide it with at least a portion of the induction structure being spaced from the at least one superconducting winding by a thermal isolation vacuum region; the at least portion of the induction structure spaced from the at least one superconducting winding by a thermal isolation vacuum region including an electromagnetic shield member; a cryostat positioned between the thermal isolation vacuum region and the induction structure; the electromagnetic shield member including a conductive, non-magnetic material; the induction structure further including an electromagnetic shield spaced from the at least one superconducting winding by a thermal isolation vacuum region; the superconducting winding being a racetrack shaped winding as disclosed by Rabinowitz ('291), for the purpose of screening the superconducting winding from non-synchronous components of the magnetic fields produced by unbalanced or transient currents in the

armature winding and absorb thermal radiation from the ambient temperature and re-radiating it at a lower temperature.

3. Claims 17 to 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. ('002) in view of Higashi and further in view of Renard et al. (U. S. Pat. No. 3, 904, 901).

Rabinowitz et al. ('002) and Higashi disclose a superconducting electric motor as described on item 1 above and also that the superconducting winding, in operation, generates flux within the rotor assembly; and

an electromagnetic shield surrounding the cryostat and the at least one superconducting winding. However, neither Rabinowitz et al. ('002) nor Higashi disclose a cryostat surrounding the rotor assembly.

Renard et al. disclose a cryostat (119, 120) surrounding the rotor, for the purpose of maintaining the at least one superconducting winding at cryogenic temperatures.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002) and Higashi and provide it with a cryostat surrounding the rotor as disclosed by Renard et al., for the purpose of maintaining the at least one superconducting winding at cryogenic temperatures.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. ('002) in view of Higashi and of Rabinowitz ('291) as applied to claim 10 above, and further in view of Kalsi et al. (U. S. Pat. No. 5, 602, 430).

Rabinowitz et al. ('002), Higashi and Rabinowitz ('291) disclose a superconducting electric motor as described on item 2 above. However, neither

Rabinowitz et al. ('002), Higashi nor Rabinowitz ('291) disclose that the support member includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines extending through the laminations during operation of the superconducting electric motor.

Kalsi et al. disclose that the support member includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines extending through the laminations during operation of the superconducting electric motor (figures 1 and 2), for the purpose of reducing the migration of stray magnetic flux out of the core poles.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002), Higashi and Rabinowitz ('291) and provide it with a support member includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines extending through the laminations during operation of the superconducting electric motor as disclose by Kalsi et al., for the purpose of reducing the migration of stray magnetic flux out of the core.

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabinowitz et al. ('002) in view of Higashi and further of Renard et al. as applied to claim 17 above, and further in view of Kalsi et al. (U. S. Pat. No. 5, 602, 430).

Rabinowitz et al. ('002), Higashi and Renard et al. disclose a superconducting electric motor as described on item 3 above. However, neither Rabinowitz et al. ('002), Higashi nor Renard et al. disclose that the support member includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines

extending through the laminations during operation of the superconducting electric motor.

Kalsi et al. disclose that the support member includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines extending through the laminations during operation of the superconducting electric motor, for the purpose of reducing the migration of stray magnetic flux out of the core poles.

It would have been obvious at the time the invention was made to modify the superconducting electric motor of Rabinowitz et al. ('002), Higashi and Renard et al. and provide it with a support member includes a plurality of laminations, each lamination lying in a plane parallel to magnetic field flux lines extending through the laminations during operation of the superconducting electric motor as disclose by Kalsi et al., for the purpose of reducing the migration of stray magnetic flux out of the core.

Response to Arguments

Applicant's arguments with respect to claims 1 to 22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guillermo Perez whose telephone number is (703) 306-5443. The examiner can normally be reached on Monday through Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308 1371. The fax phone

numbers for the organization where this application or proceeding is assigned are (703) 305 3432 for regular communications and (703) 305 3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

Guillermo Perez
December 11, 2000

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